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ROYAL AIR FORCE.

PIGEON SERVICE MANUAL.

(England — Royal Air Force.

~~Air Ministry~~,
June, 1919.

[Regs. — II. Pigeons.]

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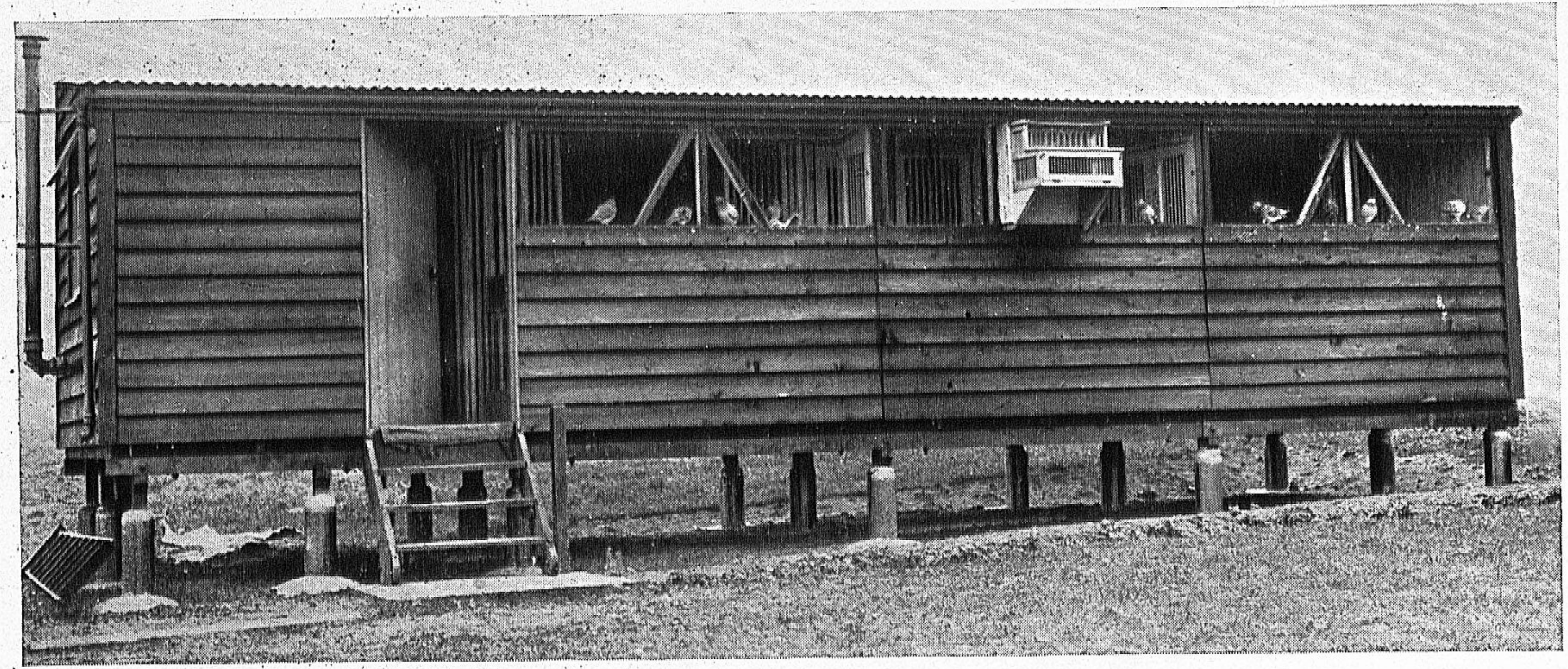

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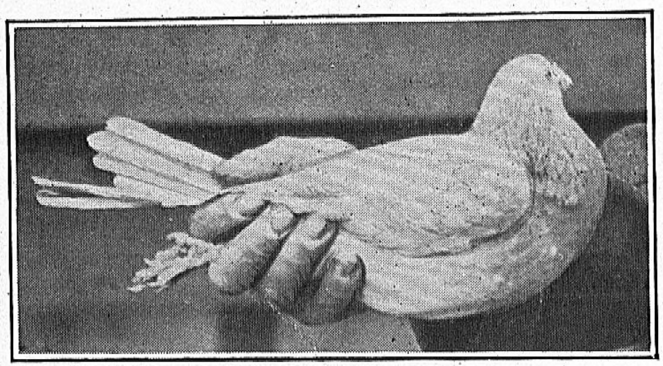
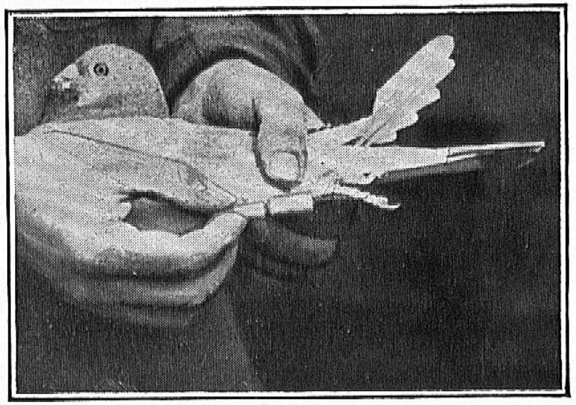


Showing correct method of holding pigeon.



How to hold pigeon so that message container is held firm when inserting thimble.

PIGEON SERVICE MANUAL.

INTRODUCTION.

1. Unless one has been intimately in touch with pigeons, at one of the active Air Stations where a Pigeon Service has been established, their usefulness and value is not appreciated. That their "Service rendered" has been of inestimable value there is no doubt, and pilots and observers are to be found everywhere who owe the saving of their lives to the agency of these little winged heroes. Heroes they are, for on occasions they have fought their way through the most adverse weather conditions carrying messages which meant everything to those who liberated them.

2. It has therefore become necessary to issue a publication explaining to some extent, their capabilities, management and use, in so far as required by the Royal Air Force, for the guidance of all concerned. This manual, therefore, is only intended to supply information applicable specially to the use of pigeons from aircraft, and not contained in the ordinary text books on the subject of racing pigeons.

3. The pigeon used to-day for message service has been bred for generations from selected parents, all of whom have established their merits by homing from distances, in some cases as great as 500 or 600 miles.

4. In order to obtain the best possible results from pigeons employed by the Royal Air Force, Pigeon experts with a thorough knowledge of the training and care of pigeons, are placed in charge of the lofts. This is an assurance to pilots that only reliable pigeons are supplied to them.

5. Pilots and observers should be thoroughly conversant with the handling of pigeons, and for this purpose instructional lofts have been erected.

6. Experience has shown that pigeons to be used from Aircraft require a special education for this class of work.

7. Although the Pigeon Service personnel is composed of experts, the training of pigeons from aircraft varies considerably. Therefore, each man on entering the Service is given a course of instruction at one of the established centres in the management and maintenance of a R.A.F. pigeon loft.

8. It has to be borne in mind that owing to the vagaries of the weather, the difference in the condition of the birds themselves, and again the varying results obtained according to the season of the year, the Pigeon Service generally is not intended to take the place of any existing means of communication, but to serve as an auxiliary.

9. The success of the service depends largely on cordial and unselfish co-operation. Unless officers commanding units arrange that all necessary facilities for the training of birds are provided for the expert, the pigeon will not be fit for the work it is called upon to do. (*Vide* A.M.W.O. 624/1918.) As a rule pigeons are not used until all other means of communication fail. Therefore, their messages in many cases hold the balance between life and death.

(22680.) Wt. 1282—979/272 (F 346). 1000. 6/19. **D & S. G. 2.**

CHAPTER I.

THE LOFT.

10. The accommodation provided for the birds must be ample, since pigeons will not thrive if kept in a crowded loft. Fourteen to fifteen cubic feet of space should be reckoned to each bird. Thus a loft 6 feet wide, 8 feet long, and 7 feet high would accommodate 12 pairs of old birds for breeding purposes. This space will, in addition, accommodate an equal number of young birds until the latter are old enough to be removed to a new loft.

11. Each loft requires to be installed with a trap, or traps, for the birds to enter, each trap being fitted with a small electrical apparatus in order to notify the arrival of a bird with its message.

12. The interior of the loft must be light, well ventilated, and should be fitted with a sufficient number of small perches to accommodate the whole of the inmates.

13. A standard loft requires, for 150 birds, at least one expert attendant, who should, in addition, be supplied with a fatigue man, whom he can instruct in the handling of the bird in case of his own absence.

CHAPTER II.

LOFT EQUIPMENT.

14. A standard loft containing 150 birds would require the following personnel and equipment:—

(*a*) *Personnel.*

1 N.C.O. (pigeon expert).
1 Fatigue man.

(*b*) *Equipment.*

Peas, sacks	4
Grit, cwts.	2
Fountains, water	3
Hoppers, grit	3
Bath, pigeon	1
Brush, sweeping (hand)	1
Pail, iron galvanised (4 gals.)	1
Can, water toilet	1
Shovel, fire	1
Scrapers, "V"-shaped	1
Nest pans	60
Nest eggs	60
*Baskets, with troughs "D" pattern	2
" " " "W" "	2
†Boxes, seaplane, pigeon	—
Carriers, message	20
Pads, message	10
Rings, celluloid	144
Insectide tins	4

* "D" pattern baskets are issued to stations equipped with flying boats in addition.

† Issue of pigeon boxes will be arranged according to number and type of machines or airships on the establishments of the unit served by the pigeon loft. These boxes are now standardised.

BRITISH MUSEUM

‡Whiting lbs.	56
Brushes for whiting	1
Bins for storage of corn	2

‡ A little disinfecting fluid should be added to whiting solution before using.

NOTE.—An extra fatigue man is needed for every additional 50-100 birds.

15. Replacements of pigeons to keep the loft up to requisite strength will be made by Pigeon Service, when it is considered necessary, and further stocks of pigeons become available at Pigeon Service H.Q.

CHAPTER III.

SERIAL LOFT NUMBERS.

16. Each pigeon loft is given a serial number, with a rubber stamp for its marking. All pigeons in the loft are stamped with this number on three long flights of each wing. Messages are also stamped before being taken out on patrol. In the event of a bird failing to reach its loft it is then possible for the air station to which the officer or other rank sending the message belongs, to be identified. The Postal Authorities have instructions to transmit such messages by telegraph "urgent priority," to the Air Ministry, and they will then be transmitted from the Air Ministry to the unit concerned.

CHAPTER IV.

HOW TO TRAIN THE PIGEONS.

17. Pigeons intended for use from a R.A.F. loft with a Marine Operational Unit should be given training by gradual stages along the coast in both directions. After the pigeon has been settled to the loft it should be trained by distances along the coast in both directions of 1, 2, 4, 6, and 10 miles, and thereafter every 10 miles up to as far as the patrols reconnoitre, so that the birds will readily home from whatever point they strike the land.

18. At home it is generally possible to give the pigeons their preliminary land training by rail, but if any difficulty is experienced, arrangements should be made for mechanical transport.

19. Sea tosses follow, and here the assistance of the local Naval Authorities should be obtained, if possible. Sea tosses at distances of 5, 10, 15, and 20 miles should be carried out. If it is not possible to obtain sea transport, the birds should be taken for their sea tosses by air, but the fact that the machines can only carry a limited number is a drawback to this method.

20. Before being used for actual message work, pigeons should be given several tosses from the air, and, if possible, at least one toss, one at a time at intervals of about 10 minutes at the extreme limit of the patrol.

21. It is important that large numbers of pigeons should not be liberated for training in one batch from one stage at the same time.

Good pigeons are scarce, and the weather is always a danger. The largest number that should be released at once is twenty.

22. In addition to the birds taken on service, a second box of birds should always be carried and released from the air for training.

23. Pigeons at an air station may have at some time or other the lives of pilots and observers dependent upon their wings, and unless the birds are properly trained they cannot possibly be expected to carry the vital message home.

CHAPTER V.

FLYING AT NIGHT.

24. Pigeons have been trained to fly at night, but for only comparatively short distances, and also in the twilight. This latter is of greatest value, especially when a pigeon has been released late in the evening with a message of distress.

25. The training must, however, be very carefully carried out, commencing with letting them out of the loft in the evening and preventing them from settling on the loft by the waving of a flag or some similar article.

26. This should commence late in the afternoon and gradually be extended to later in the evening.

27. The pigeons should then be given a few short tosses in the evening gradually extending towards the dusk, but every care must be taken to ensure that time is given for the pigeons to get home before absolute darkness.

CHAPTER VI.

THE YOUNG PIGEON.

28. Pigeons, if well and liberally fed, will rear young at nearly all seasons of the year, but the best time to select for mating the birds is about the middle of February. The cock and hen birds must be separated for about a month before they are mated.

29. Eight days after mating, the hen will lay her first egg; then after an interval of a day the second egg should be laid. The young will hatch 17 days later.

30. Both cock and hen sit and rear the young, the cock covering the eggs from 11 a.m. to 3 p.m., and the hen sitting during the remainder of the day and night. It is important to note this fact in order to arrange the birds' training flights.

31. The young can be removed from their parents at the end of 30 days, when, if they are well reared, they will be able to fly and feed themselves.

32. As soon as the young are old enough, they should be placed in a separate loft. A few days later, when accustomed to perch, sleep, and feed in this loft, they can be let out, but must not be given training flights until quite accustomed to the surroundings of their new home. This requires from two or three weeks' exercising flights.

33. The young pigeons, known as "squeakers," should be ready for Service work when three months old; at this age good strong

young birds will be ready to accomplish flights of from 10 to 50 miles, if they have been well trained.

34. Training can commence as soon as the "squeakers" are thoroughly accustomed to their home, or loft, and have learned to find it themselves and to return for food after taking exercise. The more freely pigeons fly when exercising about their home, the better their condition will be, and the more speedily will they home when flying back with a message.

CHAPTER VII.

THE MESSAGE.

Writing the Message.

35. The message should contain fully but briefly what is required. It should always give the name of the station to which the machine belongs or the serial number of the pigeon loft, and in the cases of forced landings convey the following information as far as possible:—

(*a*) Cause of landing.
(*b*) Nature of trouble, and any useful information.
(*c*) Position.
(*d*) Time and date.

In addition pigeon messages are of inestimable value in cases like the following:—

Dispatch of non-urgent messages from airships.
Failure of W/T or engines in airships.
Dispatch from aircraft of messages of a nature which it is not desired to send by wireless.
Reconnaissance over large tracts of desert or inhabited country by aeroplane.

They should also be of value on long reconnaissance and contact patrols, as in the event of a forced landing, the report can still be forwarded and much valuable information thus obtained. It would also prevent airmen being reported killed who had landed in the enemy lines.

Sending the Message.

36. The handling and release of pigeons demands very little skill, but a certain amount of care on the part of pilot or observer. The bird, when taken from the box or basket, should be held gently but firmly with the thumb across its back, the first finger just under the vent, and the remaining three fingers resting on its breast, holding the legs between the first and second fingers. The fixing of the inner portion of the message carrier will then be found to be a simple matter. To release the pigeon, the bird should be held as one would hold a stick, and then thrown, opening the hand immediately so as not to pull out any feathers. (The methods of release from different types of aircraft are stated in another chapter.)

Message Pad.

37. Special message blocks (F.S. Form 197) made up in pads for 25 messages with carbon interleaved, are provided, and so arranged

that perforated copies can be torn off, leaving one sheet in the book as a record. When the message is written it is folded up and placed in the

Message Carrier.

38. This is of special design (*see* illustrations) and made of aluminium for lightness. The message is placed in the smaller receptacle, and that in turn is placed in the larger receptacle.

CHAPTER VIII.

THE RELEASE FROM THE AIR.

39. Experiments carried out with a view to determining the simplest and safest methods of release of pigeons from airships and seaplanes in flight have rendered the following results:—

40. Reports from various airship stations are practically in agreement that the outward and downward throw is the most reliable. But is must be remembered that a firm hold of the bird is essential to a strong throw either over the side or aft. A slight or weak throw causes the bird to open its wings on too close proximity to the airship, and there is always danger then of collision.

41. In many types of airships it is unnecessary to stop the engines or even reduce their revolutions, but in some, however, the forward engine or the aft engine has to be slowed down. Immediately, the pigeon is released, however, the engines are restarted to discourage the pigeon from settling on the envelope or other part of the body, where it might find a temporary perch.

42. Releases from seaplanes are very much alike. It is generally a simple toss into the air, ensuring that the bird is carried well over the tail planes, and falls clear of the machine. It is, however, the practice of some experienced observers to grasp the bird in his right hand, the thumb underneath the legs and the four fingers over its wings and back, and then throw the bird well out at the right hand side of the machine at an angle of 20 degrees below the horizontal. Experience indicates that this latter is the best method of releasing from seaplanes or aeroplanes. Again, a firm and strong hold are essential if the pigeon is not to be blown on to the tail planes.

CHAPTER IX.

PIGEONS ON SERVICE.

43. Not less than two birds are carried for service purposes on seaplanes and aeroplanes, and duplicate messages can be sent on these two birds, or the second bird can be kept for a further message as thought advisable. A duplicate of the original message should always, however, be placed on the second pigeon. Birds should be released at intervals, if possible of not less than ten minutes to avoid flying together.

44. If one or both the service pigeons home without a message, it is a signal of distress, and search should be made for the machine taking out the bird or birds in question, but as there is no indication of the position of the machine, senders should only resort to this course in cases of extreme necessity. It is of first importance, therefore,

that Service pigeons should not under ordinary circumstances be liberated without a message.

45. Considerable success has attended the use of homing pigeons liberated from aircraft in flight.

46. Over distances ranging from 20 to 30 miles in fine weather one pigeon can always be relied upon to reach home with a message. In bad weather, or over greater distances, it is advisable the message should be sent in duplicate by two separate pigeons.

CHAPTER X.

LOFT MANAGEMENT.

SENDING BIRDS ON SERVICE.

47. The pigeon personnel should be thoroughly conversant with the contents of this chapter, which should be strictly carried out.

48. The outside portion of the message carrier should always be clipped on the leg. The birds can be kept in the loft with this portion always attached to their legs and suffer no ill effects. Every bird must be accustomed to wear this carrier before it is sent on service.

49. The carrier should be fixed so that the removable cylinder is at the top. This is important. Care should be taken to see that the message carrier is fastened securely, but not too tight so as to injure the bird.

50. When a message is received is must immediately be handed to the Officer commanding the unit.

51. When birds are issued for service work, the ring numbers should be entered in Part II. of the Pigeon Log (F.S. Form 279) and the name or number of aircraft taking them also entered. This must always be done, so that in the event of a bird homing with a message which does not state who despatched it, these details can be ascertained immediately.

52. Every message on the message pad must be stamped with the number stamp containing the air pigeon loft number, before issued to aircraft. This will enable the Air Station, from which these messages emanate, to be ascertained at once in the event of any pigeon carrying messages going astray and failing to reach their own loft.

CHAPTER XI.

FEEDING.

53. A sufficient daily ration for birds making training flights is 1½ oz. per head per day. When possible, one-third of this food should be given in the morning soon after daybreak, and two-thirds in the afternoon. Many of the chief ailments in pigeons are due to over-feeding and want of sufficient exercise. In the breeding season the ration will need to be increased by one-third.

54. Pigeons will suffer more from thirst than shortage of food, and a good supply of clean fresh water, changed twice a day, should be given them.

55. In addition to food and water, pigeons require grit to help them to masticate their food, composed of crushed oyster shell, limestone, and flint. Clean sand, crushed oyster shell, and a lump of clean rock salt may be kept in the loft, as the latter will serve the purpose equally well.

56. A bath should be given the birds at least once a week during all seasons of the year. An open bath, about 2 ft. 6 in. square, and 4 in. deep, is best for the purpose.

57. Pigeons must always be fed inside the loft—this is very essential.

58. In fine weather the birds need exercising at least twice a day. Once outside the loft they should take exercise, and not be allowed to sit about.

59. For service pigeons the open loft should on no account be resorted to. This habit may well be fatal if the birds are released with an important message at dusk or in inclement weather, as they may then take to the fields.

CHAPTER XII.

IN THE BASKET.

60. Pigeons should not unnecessarily be kept in baskets, but when this is unavoidable, plenty of room should be given the birds to move freely, and their confinement should not be for a longer period than seven days.

61. It is desirable, where pigeons may be detained for some considerable length of time before liberation, to place the birds in a large pen or aviary, or even a small room, so that they can use their wings.

62. With all baskets in which birds are kept for more than six hours will be supplied a water trough, either fixed or detachable. The water should be changed frequently.

63. Clean short wood shavings or chaff should always be sprinkled on the bottom of baskets, and changed once a day when possible.

64. A small quantity of food should be given twice a day at 7 a.m. and 5 p.m.

65. Sexes should always be separated when the birds are put into baskets. This is very essential, as frequently feathers are badly damaged and pulled out in fighting so as to render the birds unfit for flying.

CHAPTER XIII.

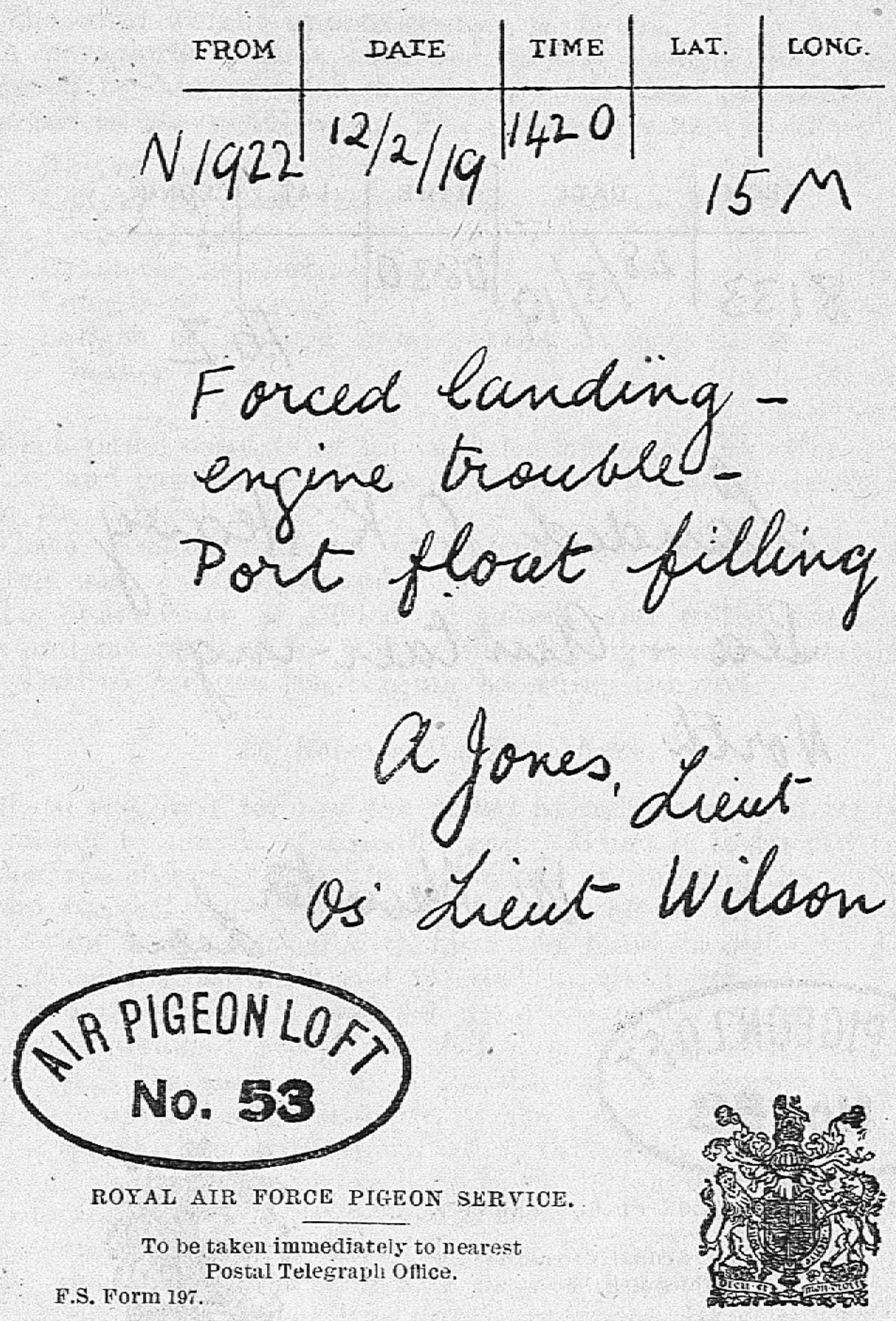
COMMUNICATIONS FROM ISOLATED UNITS.

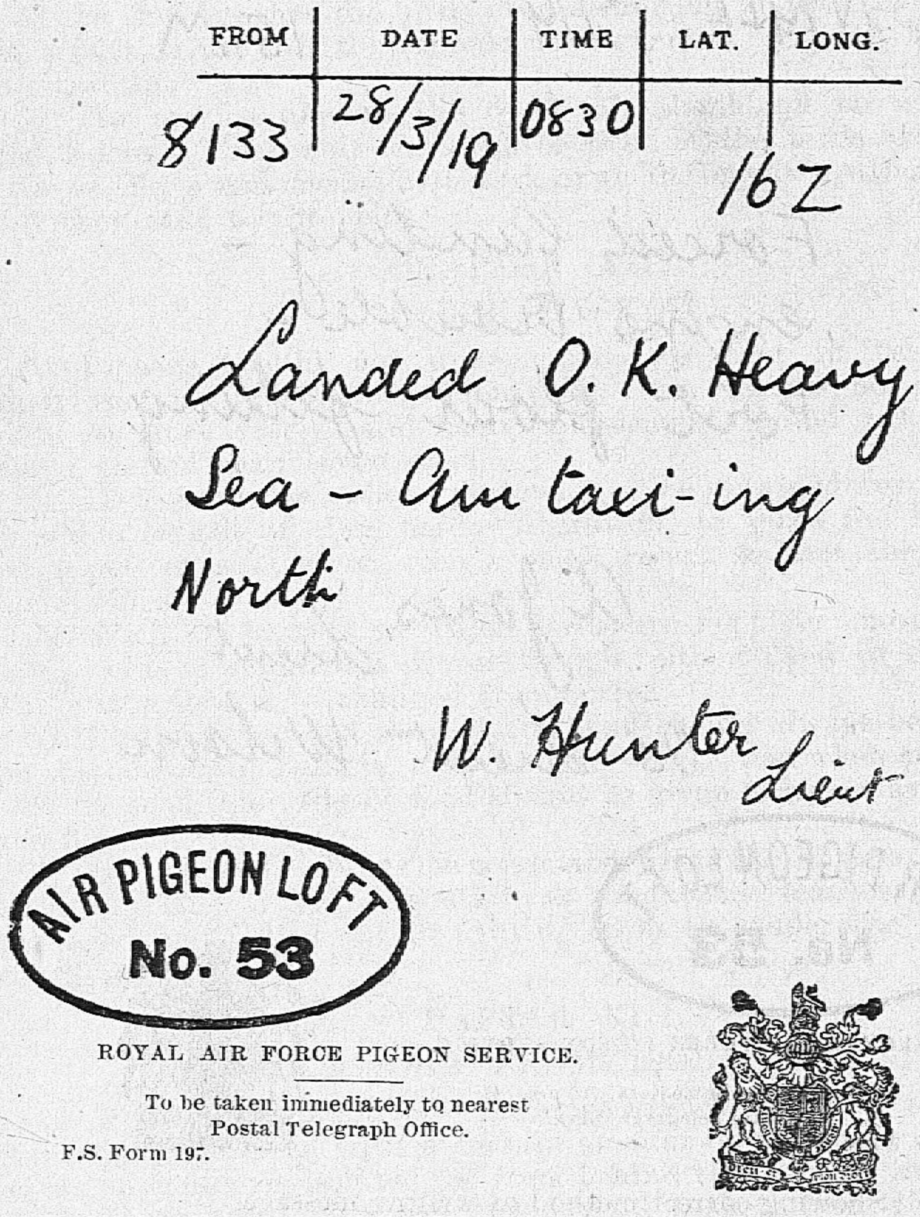
66. Pigeons are practically the only agency by which communication can be received with a certain amount of reliability from units which have become isolated, or from behind the enemy's lines.

67. These birds have been dropped in baskets from the air with much success, the following being the best methods adopted.

68. It is not advisable to drop more than two birds at a time, and for this purpose a standard sized trench pigeon basket measuring 14½ in. × 9 in. × 10 in. is used.

69. Pigeons are rolled up in a sheet of newspaper and tied around the shoulders with string. A small hole is made in the paper at the head so as to allow air to reach the bird.





FROM	DATE	TIME	LAT.	LONG.
8133	28/3/19	0830		

16Z

Landed O.K. Heavy Sea - Am taxi-ing North

W. Hunter Lieut

AIR PIGEON LOFT
No. 53

ROYAL AIR FORCE PIGEON SERVICE.

To be taken immediately to nearest
Postal Telegraph Office.

F.S. Form 197.

Another example of how to write a message.

70. A good foundation of straw is then placed in the basket, and the pigeons laid on it, the basket then being filled lightly with straw.

71. Message pad, pencil, message carriers, and 4 oz. pigeon food, enough for 2 days, are also enclosed.

72. The total weight approximately is $4\frac{1}{2}$ lbs.

73. A parachute is then attached to the basket. The parachute is designed to descend with a velocity of 30 feet per second and is constructed in the usual way. The dimensions are as follows:—

No. of panels	16
Length of panel from bottom edge to edge of central hole	15 in.
Diameter of central hole	8 in.
Length of rigging	33 in.
Length of lanyard from bottom of rigging to basket	18 in. (minimum)

74. Each panel consists of an isosceles triangle, the sides of which are 19 in. and base $9\frac{3}{8}$ in., the top 4 in. of each triangle being cut off to form the central hole.

75. These measurements *do not* include the allowance for seams, this being, say, $\frac{1}{2}$ in. all round.

76. The parachute is folded in panels and rolled from top to bottom and maintained by rolling the rigging loosely round it, care being taken to prevent the rigging becoming tangled.

To Release the Parachute.

77. Until required for use the rolled parachute is held on the top of the basket by means of a small strap. When it is desired to drop the basket the observer frees the parachute by undoing the strap, and holds the basket underneath with his left hand, and pressing the parachute on to the basket with his right hand in order to prevent it from becoming unrolled and tangled by the wind.

78. When the basket is released the observer takes care to give it a sufficiently strong " push " so that it may safely clear the tail of the machine. As soon as it is in the air the parachute unrolls itself and is opened automatically by the speed of descent.

79. The whole then drifts down wind, falling at the rate of 30 feet per second, presuming the machine to be flying up wind on to the target which gives the most accurate results.

80. In order that good shooting may be made, it is, of course, necessary that the observer should have a knowledge of the speed and direction of the prevailing wind, and also be able to judge accurately distances on the ground in order that he may make the necessary allowance.

81. In order to make the observer's calculations as simple as possible it is suggested that he should have with him a table showing the necessary ground distances to allow for various heights, and for various wind speeds. It is suggested further that, if possible, a small smoke cloud should be set up in the vicinity of the target to show the direction of the wind, the ordinary methods such as direction flags being absent.

CHAPTER XIV.

FAILURES AND THE CAUSE.

82. Figures provide an eloquent illustration of the importance of pigeon work in the Royal Air Force. The number of messages which have failed to reach their destination is less than 5 per cent., and of this 5 per cent. a considerable proportion has been due to ignorance of the pigeon's capabilities, the method of handling, or improperly attached messages.

83. Pilots and observers who have to send messages by pigeon should thoroughly familiarise themselves with the handling of birds for Service work, and the method of attaching messages.

84. Most failures, so far, have been due to liberation of birds late at night when the machine and crew were in no immediate danger. The message would probably have got through had the birds been held back till dawn.

85. In one case in which a machine crashed, the observer was "knocked out" and the pilot had had no experience of handling pigeons. In his attempt to affix a message both birds escaped and, but for the fact that a patrol boat passed soon afterwards, the crew might have been lost.

86. Fair visibility is essential to a bird in its flight. If visibility is bad, a pigeon frequently endeavours to perch on the wing tip of the machine.

CHAPTER XV.

DISPOSAL OF STRAY PIGEONS.

87. Should a message be found on any dead, wounded or stray pigeon, the message should be immediately telephoned or telegraphed to the Air Ministry, and details of the ring number of the pigeon and of all marks on the wings given. The bird itself should be sent to the Officer Commanding, Pigeon Service, R.A.F., Air Ministry, London, unless there is a Naval, Military, or Air Force Pigeon Loft in the immediate vicinity, when it should be taken to that loft for custody to await Air Ministry instructions as to disposal. It should be stated in the telegram or telephone message how the pigeon has been disposed of.

88. Particulars of a pigeon, even if it does *not* carry a message, should be reported and the bird dealt with as above if—

- (*a*) Its wings are stamped with a *foreign* name or address; or
- (*b*) It bears any foreign rings. (For this purpose any rings *other* than those marked "N.U.," "N.U.R.P.," "N.U.H.P.," "S.U.," or "U.F." may be regarded as foreign.)

89. Any pigeons other than those provided for in paragraphs (*a*) and (*b*) should be liberated wherever found, if they are uninjured and fit to fly.

90. If the bird is injured, is incapable of flight, or will not leave the vicinity, the vendors of the ring, as shown below, should be communicated with and requested to inform the owner of the bird of its whereabouts.

The following are the names and addresses of Vendors of British Rings:—

Rings marked "N.U." (National Homing Union).	The Secretary, The National Homing Union, 14, East Parade, Leeds.
Rings marked "N.U.R.P." (National Union Racing Pigeon).	"The Racing Pigeon," 19, Doughty Street, London, W.C.
Rings marked "N.U.H.P." (National Union Homing Pigeon).	"The Homing Pigeon," 7, The Crescent, Birmingham.
Rings marked "S.U." (Scottish Homing Union).	The Secretary, The Scottish Homing Union, 43, Miller Street, Larkhall, Lanarkshire.
Rings marked "U.F." (Ulster Federation).	Mr. John Jack, 81, Alexandra Park, Belfast.

91. In every case where ring numbers are quoted great care should be taken that all identification letters or marks are correctly given. The fact that a pigeon carries a rubber ring on the leg in addition to metal rings need not be taken into consideration in deciding as to the bird's disposal. It should, however, be noted that a message may be carried under the rubber ring, and this should invariably be looked for.

CHAPTER XVI.

GENERAL INFORMATION.

92. Although, as stated elsewhere, pigeons are not intended to replace any existing message service, but to act as an auxiliary only, there are some types of aircraft to which the pigeon is indispensable. For instance, machines unequipped with wireless are dependent solely upon the pigeon. Directly some types of seaplane strike the water, W/T is out of action and the pigeon comes to the rescue.

93. Care should be taken not to lose pigeons down the fuselage—this has often been done.

94. Observers should in all cases where pigeons are available, make sure that pigeons are in the machine before leaving on patrol.

95. Pigeons must be protected from draught during flight, and kept away from any smell of gas.

96. In fog or foul weather the return of the pigeon is uncertain. Occasionally, however, pigeons have been known to fight their way through. In darkness, too, the return of a bird is always doubtful. Except in cases of extreme urgency, therefore, pigeons should not be released when conditions such as these exist. For example, in the event of a forced landing, the pigeon should not be released late at night or without sufficient time being allowed to home in daylight unless the crew are in immediate danger. It is, of course, always possible that the bird may get to land, rest through the dark hours, and make for its own loft at dawn.

97. It has frequently been found in forced landings that pigeons are drowned when the machine dips. As trained pigeons are extremely valuable and difficult to replace, care should be taken to accommodate the birds as high as possible in the machine to minimise the risk of their destruction when part of the machine submerges.

98. Messages sent by pigeons are stamped "Air Pigeon Loft No. ...." In the event of stray pigeons coming into the possession of R.A.F. units bearing messages stamped as above, these messages should be signalled forthwith to the Air Ministry, and the flimsy on the bird's leg should be sent to O.C. Pigeon Service, Air Ministry, London.

99. The rate at which a pigeon flies varies with the wind and weather conditions, but 25 statute miles an hour may be taken as a fair average. The average well-bred pigeon is expected to be able with careful training, commencing when it is about three months old, to negotiate distances over land up to 80 miles during its first year, and up to 250 miles the second.

CHAPTER XVII.

SOME MERITORIOUS PERFORMANCES.

100. A Short seaplane whilst on patrol was forced to land. Two pigeons were dispatched, giving position of the wreck and requesting immediate help, as the machine had capsized and was rapidly breaking up in the rought sea. Aircraft were dispatched, and having located the wreck, directed a destroyer to it and the crew were consequently rescued. The pigeon message was the first information received giving the position of the seaplane.

Two pigeons were sent on service in a Short plane. This machine was forced to descend owing to engine trouble 30 miles from its base. A very heavy sea was running, and a strong wind prevailed at the time. The birds were liberated together at 9.32 a.m., and homed at 10.32. No news whatever concerning the machine had been received until these birds arrived. Assistance was sent, and after careful searching the machine was picked up by a motor launch. The pilot and observer consider that the information conveyed by the pigeons was the means of their being rescued.

Seaplane 8666 failed to return from patrol. The first news came from a pigeon message, and the crew of six were saved after being on the water for three days. Another pigeon with a similar message was picked up a few miles from the loft, having died from exhaustion.

Seaplane 1250 came down with engine trouble 40 miles from its base. The news came by pigeon message, and the machine was found and brought back in tow.

Seaplane 1608 descended with engine trouble 30 miles from its base. The news came by pigeon message, and the machine was brought back in tow. The birds had to fly against a very strong and cold N.W. wind.

Seaplane 4511 came down on the water 45 miles out. News came from a pigeon message, and the machine was picked up by a monitor just before dark.

Seaplane 1098 came down and was unable to rise again. The first news was a pigeon message, saying "One float gone; sinking." The machine was found and brought back.

Seaplane 8660, down on the water with engine trouble 200 miles from the base, and attacked by three enemy machines. A pigeon returned with message, containing this information, in five hours.

Seaplane 4512 crashed 10 miles from the base, one pigeon being drowned in the crash. The other pigeon was liberated, and although almost drowned, returned with a message in time for assistance to be sent. All the crew were saved.

Seaplane 4305 was shot down in flames by five enemy machines about 30 miles from the base. A pigeon brought this information, and three of the crew were saved after being in the water three-quarters of an hour.

A Short seaplane, whilst on patrol, was forced to land. A pigeon was released at 4 p.m. requesting help. The pigeon reached the loft at 4.22, having flown a distance of 22 miles in 22 minutes. Assistance was immediately sent, and all the crew were saved. The sea at the time was rough, and the machine rapidly breaking up.

A D.H. 6 was forced to descend through engine trouble. A pigeon arrived with a message to this effect, and a destroyer was directed to search for the pilot, who was picked up after he had been in the water an hour, his machine having sunk fifteen minutes after landing.

A machine was forced to land at sea, owing to thick fog. A bird was released with a ten knot wind against it. Although the pilot had completely lost his bearings owing to fog, the pigeon made straight off for land without hesitation.

A machine was forced to land. Two pigeons reached the loft in an hour. They flew through a heavy thunderstorm and high wind against them.

During a period of seventeen months, on one station alone, birds were liberated on 80 occasions from aircraft in difficulty and often actual peril. In 45 cases the pigeons brought the first information, and successful action was taken. One of the birds was shot through the left eye in action, but succeeded in reaching its loft.

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